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FEMA

2005 Hurricane Season Region/ Division Perspectives

- Region IV
- Region VI
- SAD
- MVD
- SWD



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**USACE/FEMA 2005/2006 Hurricane
Season Critique and Planning
Workshop
March 07- March 09 2006
Arlington, TX**



FEMA

**FEMA Region VI
Perspective**



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Katrina Timeline for Louisiana



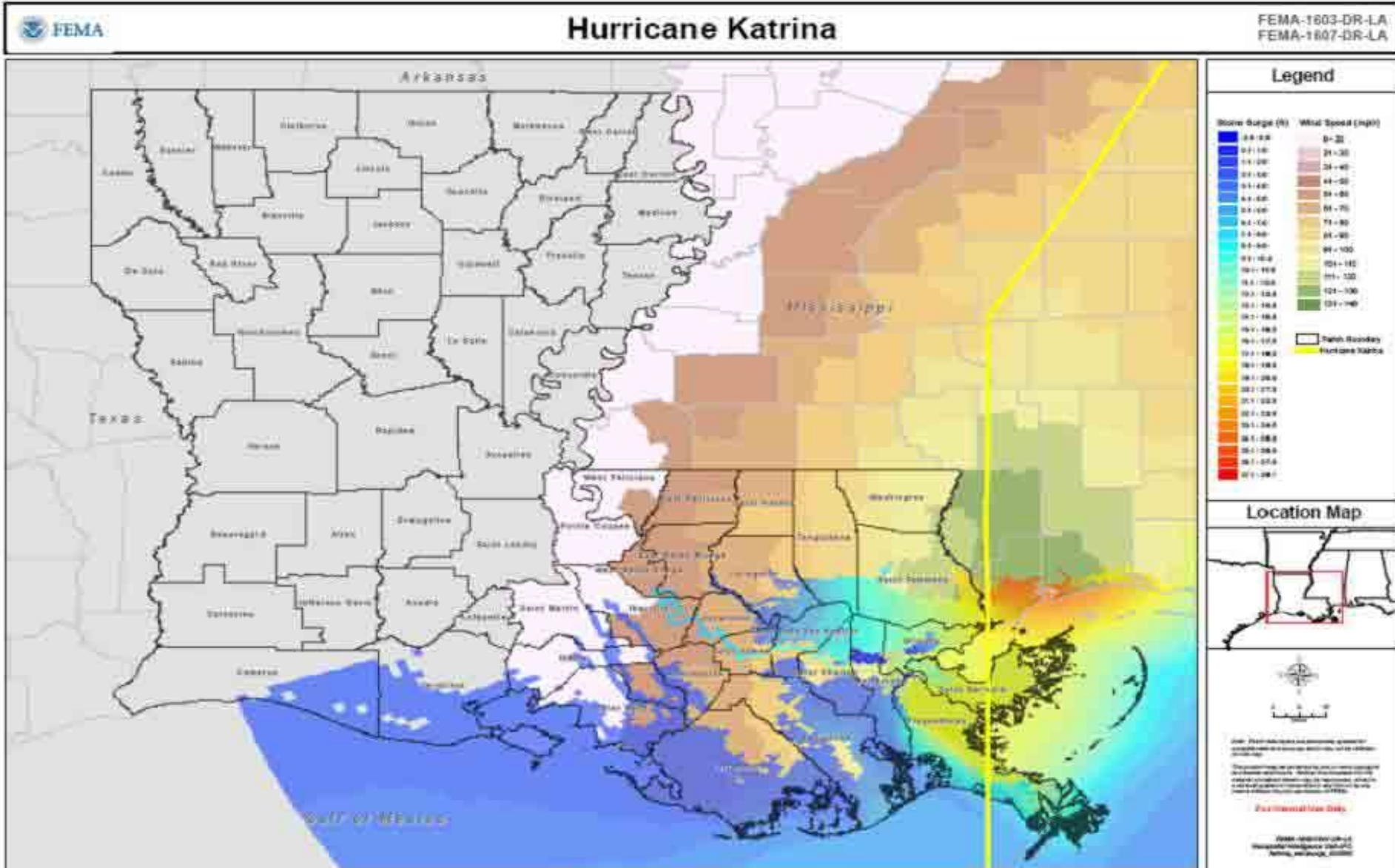
FEMA

- 08/27: Region VI RRCC activated in Denton at Level 1
- 08/27: LA EOC activated at Level 1; ERT A deployed
- 08/27: President declares FEMA-3212-EM-LA
- 08/29: Hurricane Katrina made landfall in southeastern

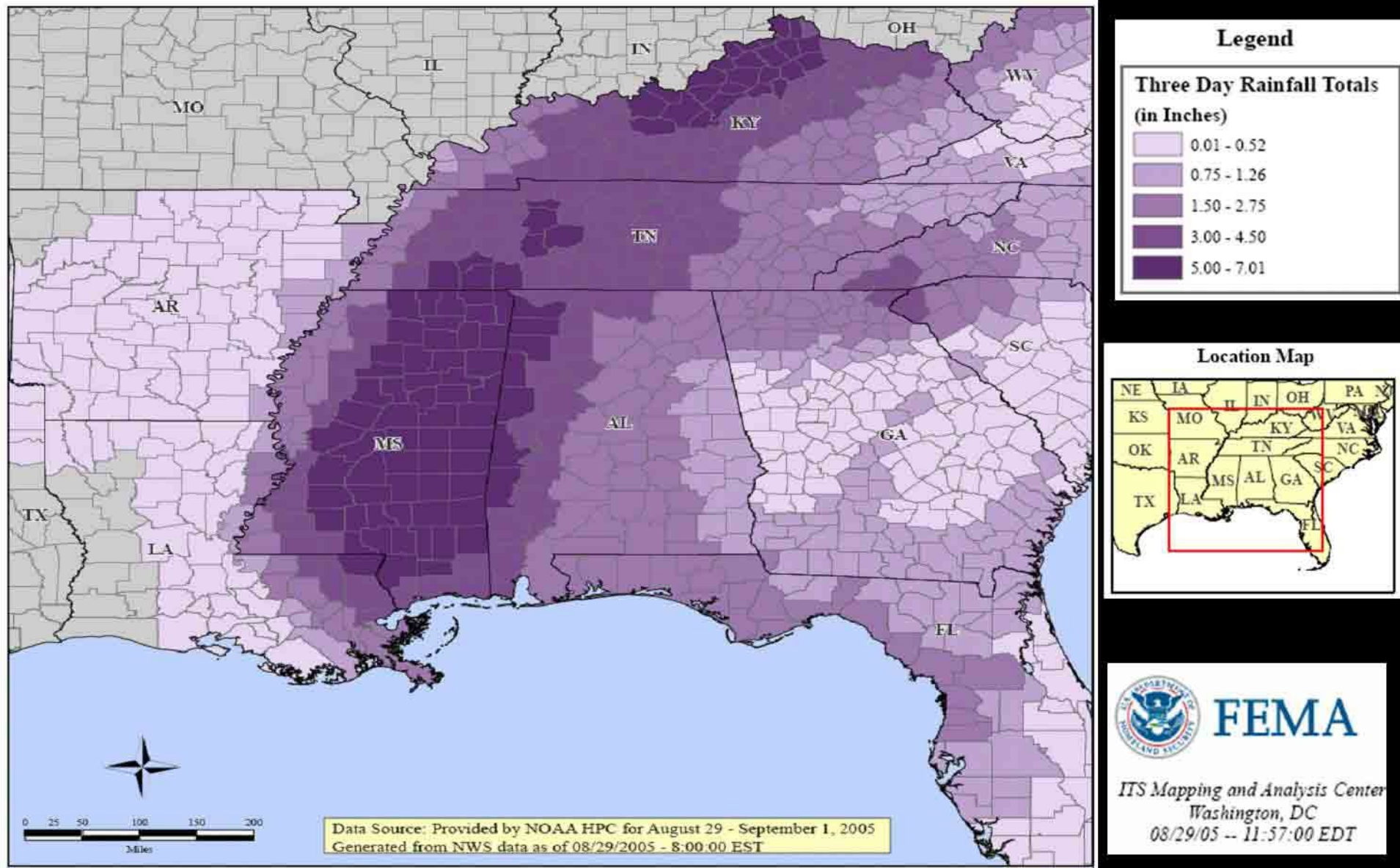
Louisiana as a Category four (4) hurricane

- 08/29: President declares FEMA-1603-DR-LA
- 09/02: President declares FEMA-3215-EM-AR
- 09/05: President declares FEMA-3219-EM-OK
- 09/07: President declares FEMA-3229-EM-NM
- 09/12: JFO becomes fully operational in LA

Wind Speed and Storm Surge



Hurricane Katrina Predicted Rainfall Totals by County August 29 - September 01, 2005





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Rita Timeline for Louisiana



FEMA

- 09/21: President declares FEMA-3260-EM-LA
- 09/24: President declares FEMA-1607-DR-LA
- 09/24: At 0230 CDT Hurricane Rita makes landfall near Sabine Pass, Texas as a Category three (3)



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Louisiana Commodities for Katrina and Rita



FEMA

- Ice
 - 2,120 Truck loads delivered (89M lbs)
- Water
 - 2,310 Truck loads delivered (10.4M lbs)
- Power
 - Approx. 330 generators used



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Temporary Roofing Operation Blue Roof for Louisiana



FEMA

Katrina and Rita:

- 80,469 roofs installed
- 36 parishes included in Blue Roof Operation



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FEMA

Temporary Roofing Status as of 22 February 2006



ID: FEMA-3216_OR-LA-
Blue_Roof_Status_20060202.mxd
GIS:EMAAK





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Debris Removal for Louisiana



FEMA

- 63 million CY total estimated
- 35.2 million CY removed / 56% complete
- White Goods:
 - 321,000 units collected
- Hazardous Waste
 - 14 million lbs. collected



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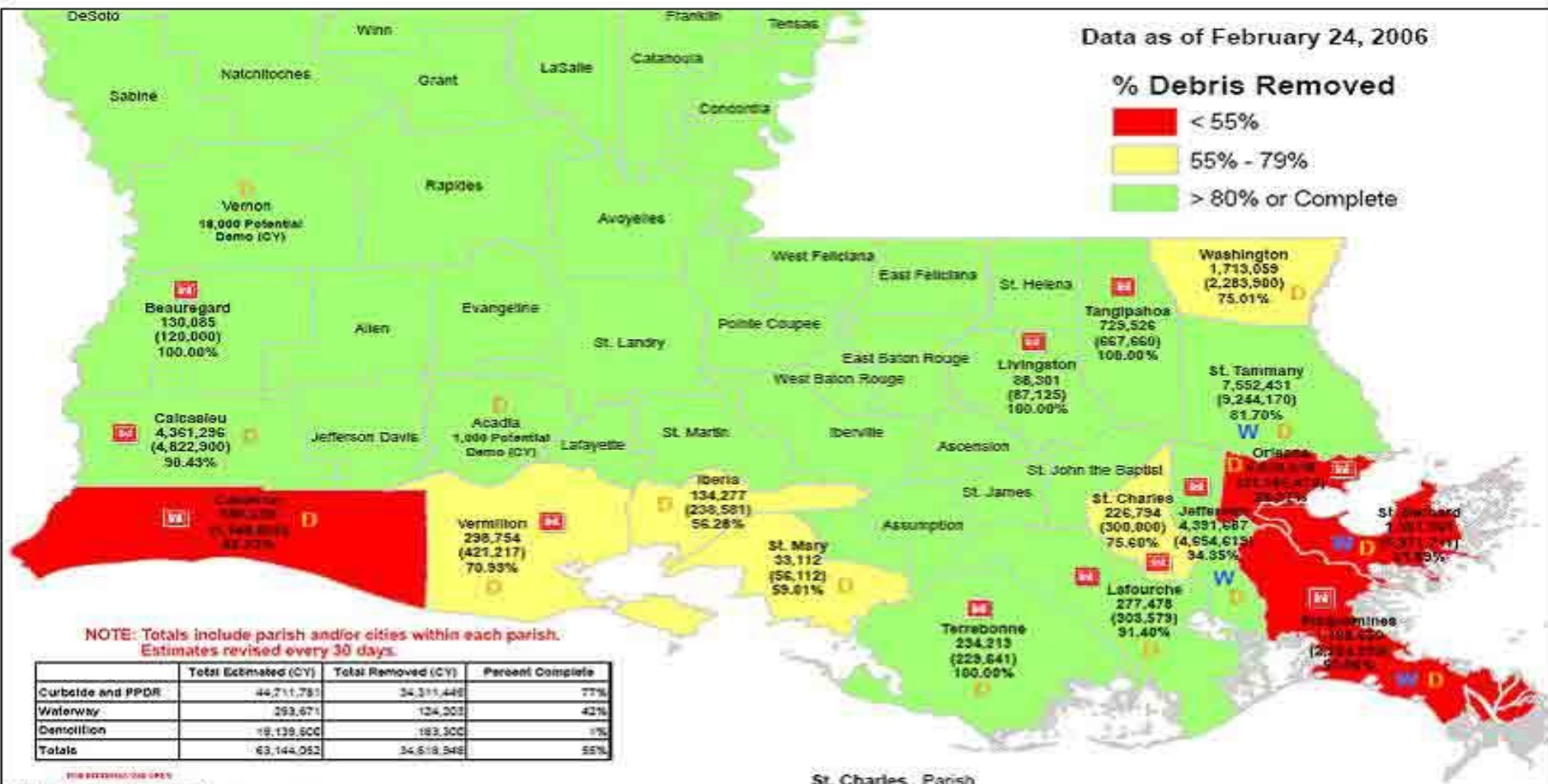
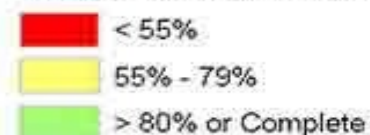
FEMA



Applicant and USACE Managed Debris FEMA-1603-1607

Data as of February 24, 2006

% Debris Removed



Active Parishes Managed by USACE
(All other Active Parishes are Applicant Managed)



Parish Includes Waterway Debris



Parish/City Includes Demolition Debris

St. Charles Parish

226,794 Total Removed (CY)
 (300,000) Total Estimated (CY)
 75.60% Percent Complete



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Louisiana Temporary Housing



FEMA

- FEMA estimated need: 98,000 units
- 47,632 currently leased
- Mission is ongoing



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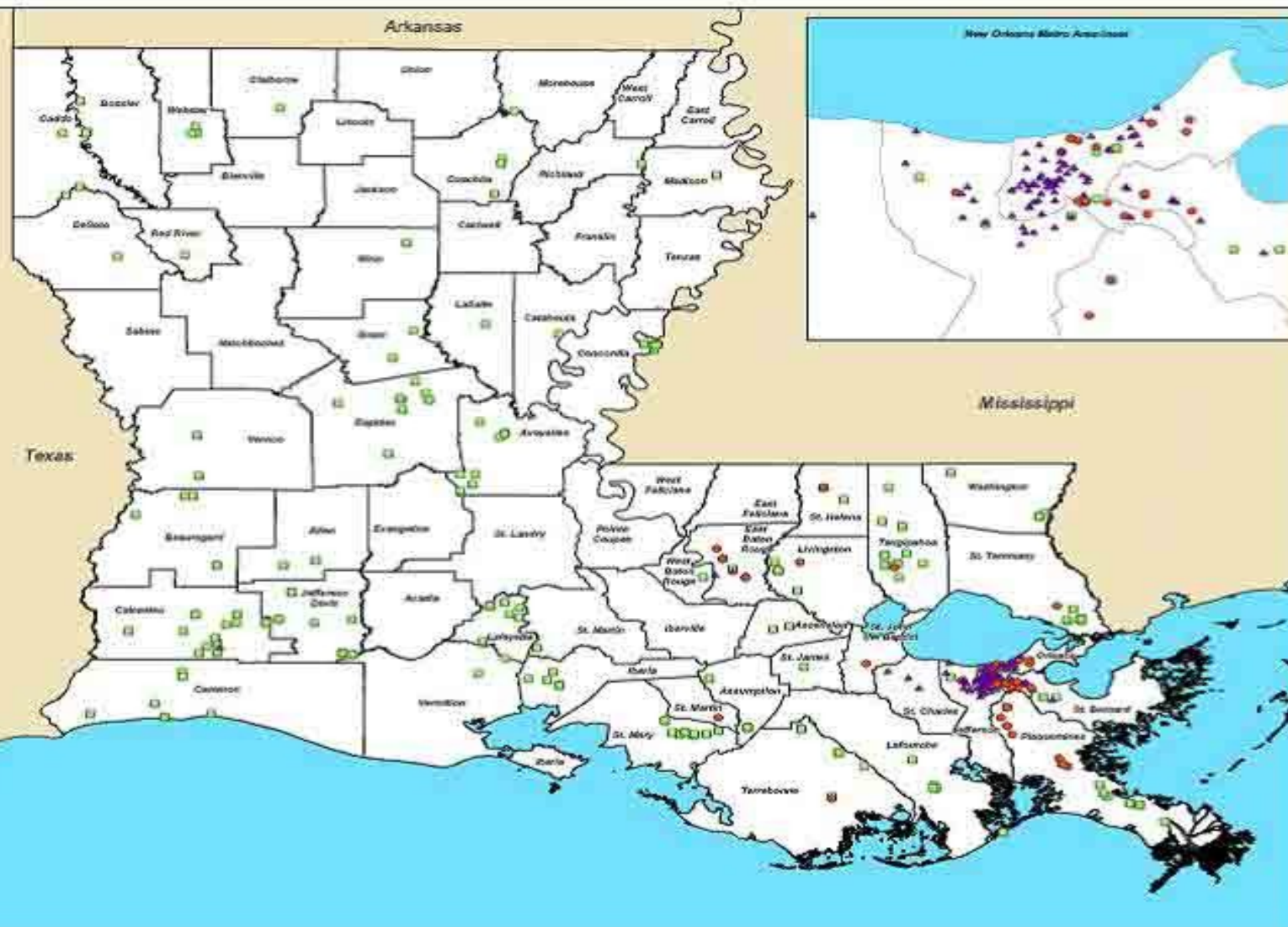


UNCLASSIFIED

FEMA



Travel Trailer Sites Louisiana, March 6, 2006



Legend

Travel Trailer Sites

- ▲ EG Site
- Group Site
- Commercial Site

0 5 10 20 Miles
[Scale bar]



PERM-100-EN-14
Revised: January 14, 2006
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LA_PT_0000_01

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Estimated site locations

FOR INTERNAL USE ONLY



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Katrina Timeline for Texas



FEMA

- 08/29: Hurricane Katrina made landfall in southeastern Louisiana as a Category four (4) hurricane; as a result an estimated 427,000 people evacuated to Texas
- 09/02: President declares FEMA-3216-EM-TX
- 09/12: JFO becomes fully operational in TX



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Rita Timeline for Texas



FEMA

- 09/19: JFO Designated as RRCC for Hurricane Rita
- 09/20: The RRCC for Hurricane Rita begins operations in the Austin JFO
- 09/21: President declares FEMA-3261-EM-TX
- 09/24: At 0230 CDT Hurricane Rita makes landfall near
Sabine Pass, Texas as a Category three (3)
- 09/24: President declares FEMA-1606-DR-TX
- 09/24: Texas JFO opened in Austin; RRCC continues operations

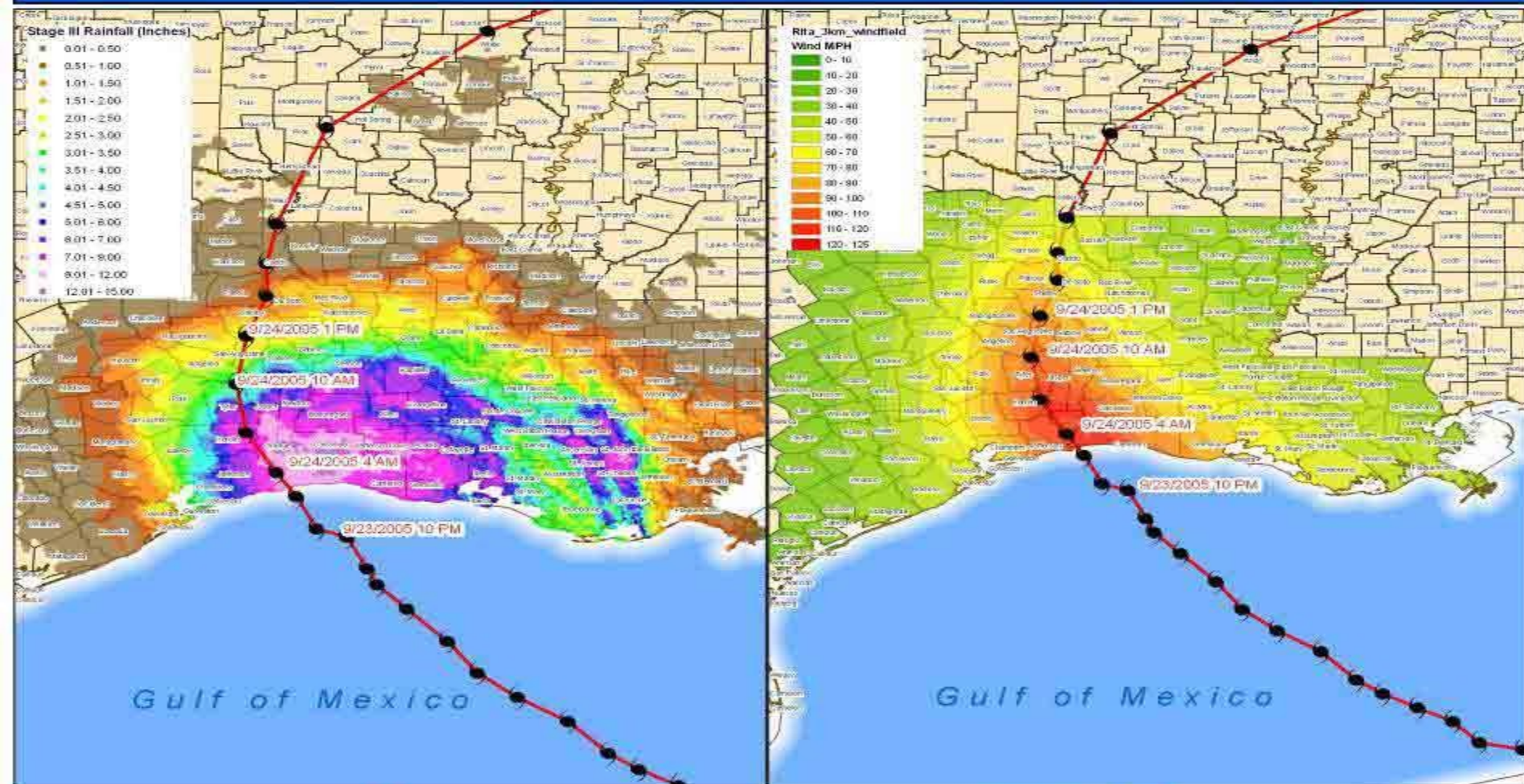


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FEMA

Hurricane Rita - 24 Hour Stage III Rainfall and Wind Speeds

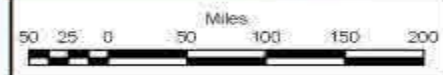


FEMA

ID: FEMA-1808-DR-TX
FEMA-AUSTIN RRCC/JFO; DATE: 12/23/05
Rainfall_Wind_20051222.mxd
GIS: EMAAK



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FEMA

Texas Commodities

- Ice
 - 744 Truck loads delivered (3M lbs/\$17M)
- Water
 - 909 Truck loads delivered (4.5M gallons/\$16M)
- Power
 - 289 generators installed (\$41M)



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Temporary Roofing Operation Blue Roof for Texas



FEMA

- 22 Counties
- Over 20,000 installed
- \$44M (\$2,100/house)



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FEMA

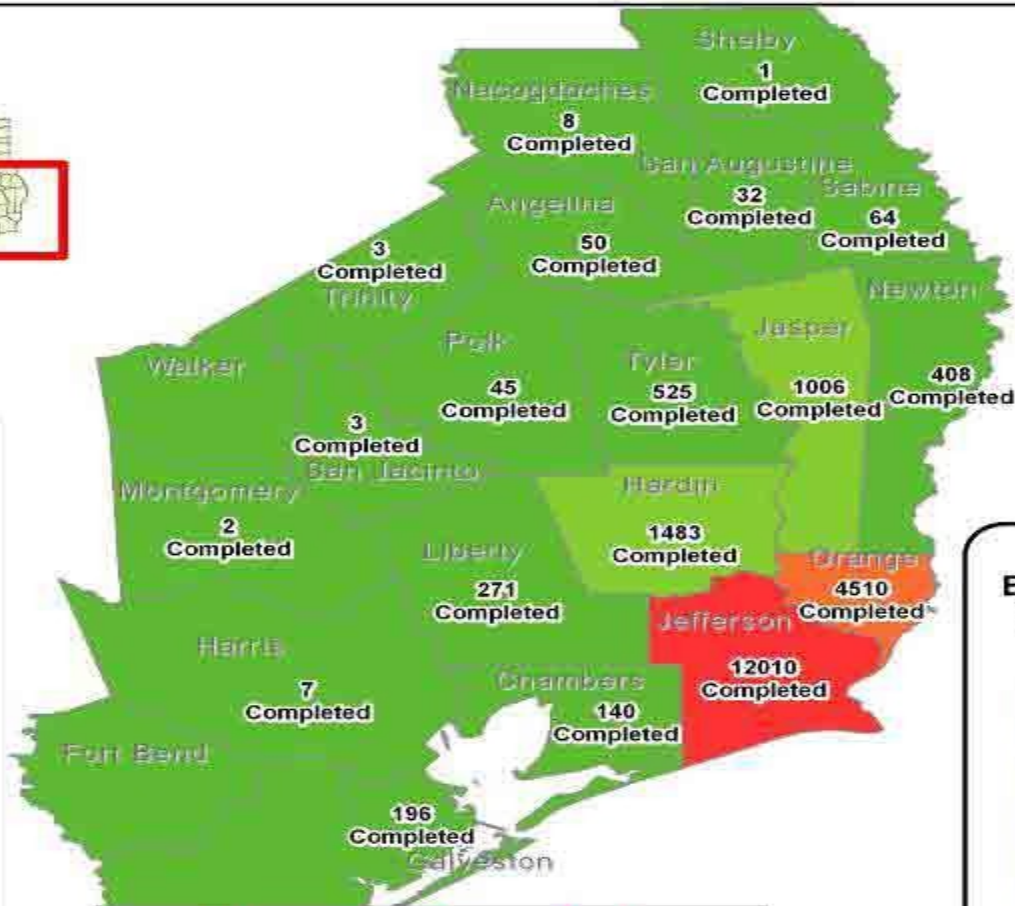
Hurricane Rita - Roofing Mission Status



Roofs Completed: (Total)

Est. 20874

Angelina County: 50
 Brazoria County: 0
 Chambers County: 139
 Fort Bend County: 0
 Galveston County: 194
 Hardin County: 1471
 Harris County: 7
 Jasper County: 997
 Jefferson County: 11955
 Liberty County: 270
 Montgomery County: 2
 Nacogdoches County: 8
 Newton County: 402
 Orange County: 4483
 Polk County: 41
 Sabine County: 64
 San Augustine County: 32
 San Jacinto County: 2
 Shelby County: 1
 Trinity County: 3
 Tyler County: 513
 Walker County: 0



Mission Complete
20,870 Roofs Completed

Estimated Damaged Roofs per County

18 December 2005



FEMA

ID: FEMA-1608-DR-TX
 FEMA-AUSTIN RRCC/JFC: 12/18/05: 1206
 Roofing_SITREP_20060303.mxd
 3/19/06 E:Maak





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Debris Removal for Texas



FEMA

- 8.6 million CY total estimated
- 8.5 million CY removed / 99% complete
- USACE 4.8 million CY / \$150 million (\$22/CY)
- 19,170 stumps removed
- 13 sunken vessels removed from waterways



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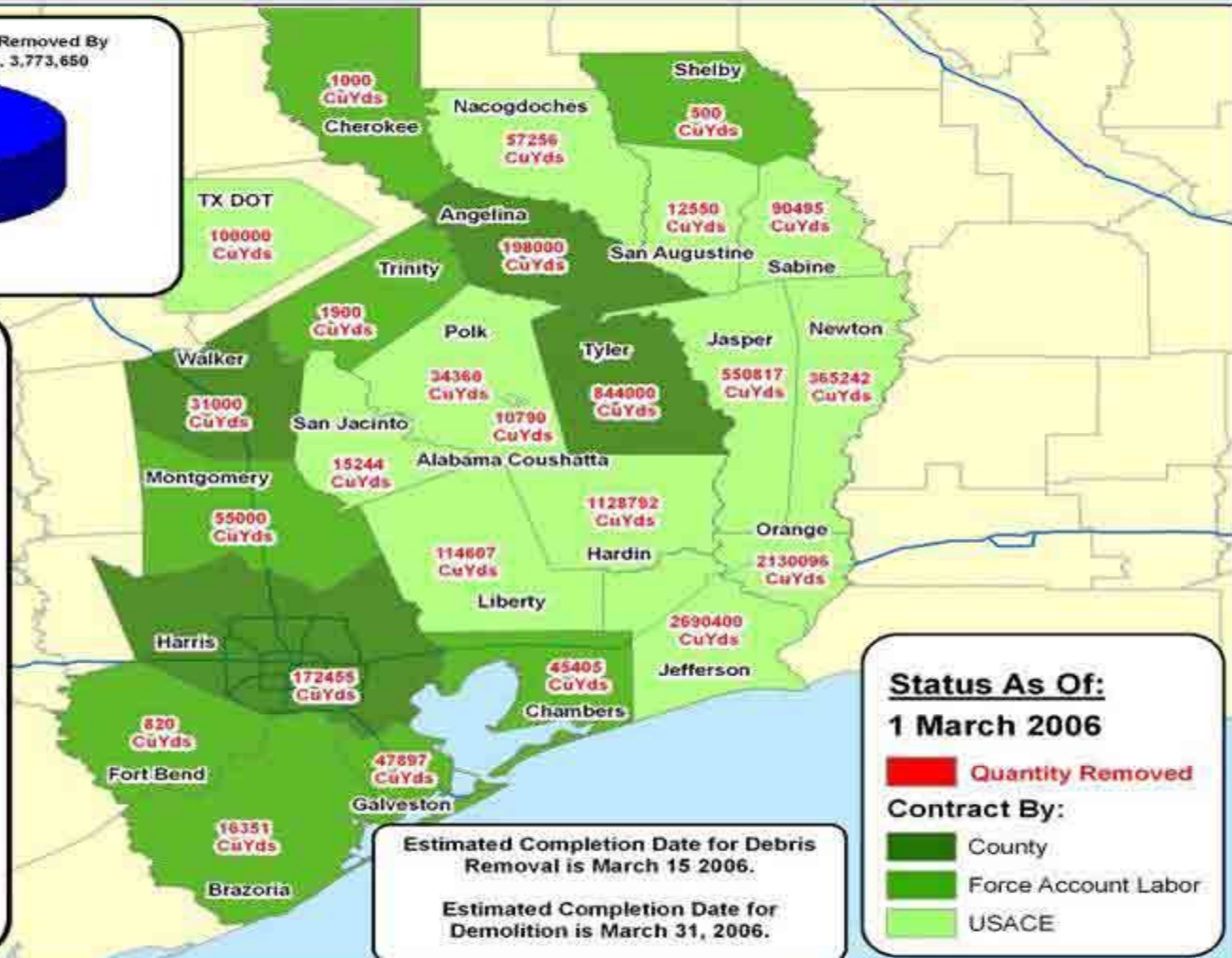
FEMA

Hurricane Rita: Debris Mission Status



Estimated / Remaining
(In CuYds)

Alabama Coushatta:	10790 / 0
Angelina:	198000 / 0
Brazoria:	16351 / 0
Chambers:	45405 / 0
Cherokee:	1000 / 0
Fort Bend:	820 / 0
Galveston:	47897 / 0
Hardin:	1158783 / 39184
Harris:	172455 / 0
Jasper:	554298 / 9645
Jefferson:	2697881 / 9049
Liberty:	114607 / 0
Montgomery:	55000 / 0
Nacogdoches:	57256 / 0
Newton:	350000 / 3714
Orange:	2135000 / 22579
Polk:	34360 / 0
Sabine:	91000 / 1815
San Augustine:	25000 / 0
San Jacinto:	15244 / 0
Shelby:	500 / 0
Trinity:	1900 / 0
TX DOT:	100000 / 0
Tyler:	832000 / 1901
Walker:	31000 / 0



Status As Of:
1 March 2006

Quantity Removed
Contract By:

- County
- Force Account Labor
- USACE

Estimated Completion Date for Debris
Removal is March 15 2006.

Estimated Completion Date for
Demolition is March 31, 2006.



ID: FEMA-1058-CR-TX
FEMA-AUSTIN BRCCUFO: 201006
Debris_Removal_USACE_20060303A.mxd
GIS: EMARK





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FEMA

Hurricane Rita - Sunken Vessel Removal

Total Grounded/Sunken Vessels in TX & LA:	111
Recovered (Cases Closed):	58
Remaining (Open Cases):	53
Active Removal:	0
Cases under ESF-3:	34
Cases under ESF-10:	29
Cases Located in Louisiana:	17



Port Arthur



111 Total Vessels

- Cleared
- In Louisiana
- Medium
- Low





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Texas Temporary Housing



FEMA

- FEMA estimated need: 3,900 - 4,200 units
- 3,612 currently leased
- \$150 million (\$50K/set)
- Mission is ongoing



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FEMA

Temporary Housing

Travel Trailers Leased as of 25 February 2006

FEMA-1606-DR-TX Designated Counties



City

Responsible Contractor

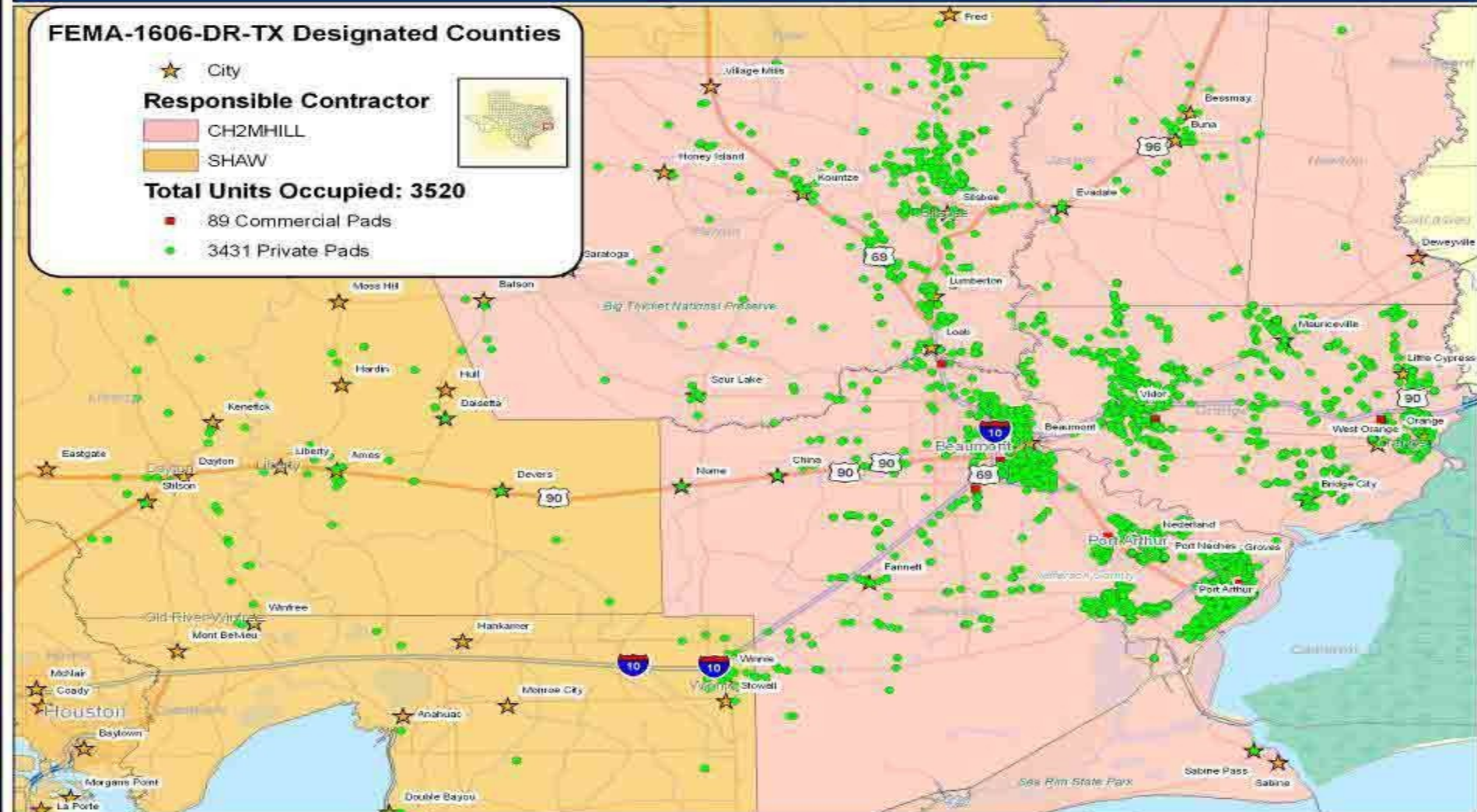
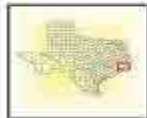
CH2MHILL

SHAW

Total Units Occupied: 3520

89 Commercial Pads

3431 Private Pads



FEMA

ID: FEMA-1606-DR-TX
FEMA-AUSTIN RRCC/PO: 02/27/06
TT_DHOPS_BRIEF_20060225.mxd
GIS: SMAAK, EDUDLEY



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Lessons Learned

- Need for more USACE personnel in response (RRCC) to multiple missions (levies, water, ice, generators)
- USACE contract language definitions:
 - “installed” vs. “operating” generators created confusion
 - “installed” vs. “inspected” roofing created confusion



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Best Practices

- During the Disaster:
 - Planning and Response Team (PRT) leaders from USACE were co-located with RRCC
 - RRCC was co-located with the JFO so operations transitioned smoothly from RRCC response to JFO response and recovery
 - USACE representative embedded in Planning (GIS)
 - Invaluable for response and recovery
 - Facilitated easier communication
 - Common operational picture regarding USACE operations